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TI **Immunomodulating** actions of carotenoids: Enhancement of in vivo and in vitro antibody production to T-dependent antigens

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DT Journal

LA English

CC 18-2 (Animal Nutrition)

Section cross-reference(s): 15

AB Previously, the authors demonstrated an enhancement of in vitro antibody (Ab) prodn. in response to T-dependent antigens (TD-Ag) by astaxanthin, a carotenoid without vitamin A activity. The effects of .beta.-carotene, a carotenoid with vitamin A activity, and **lutein**, another carotenoid without vitamin A activity, on in vitro Ab prodn. were examd. with spleen cells from young and old B6 mice. In addn., the in vivo effects of **lutein**, astaxanthin, and .beta.-carotene on Ab prodn. were studied in young and old B6 mice. **Lutein**, but not .beta.-carotene, enhanced in vitro Ab prodn. in response to TD-Ags. The depletion of T-helper cells prevented the enhancement of Ab prodn. by **lutein** and astaxanthin. In vivo Ab prodn. in response to TD-Ag was significantly enhanced by **lutein**, astaxanthin, and .beta.-carotene. The nos. of IgM- and IgG-secreting cells also increased in vivo with the administration of these carotenoids when mice were primed

with TD-Ags. Antibody prodn. in response to TD-Ags in vivo and in vitro was significantly lower in old than in young B6 mice. Astaxanthin supplements partially restored decreased in vivo Ab prodn. in response to TD-Ags in old B6 mice. **Lutein** and .beta.-carotene also enhanced in vivo Ab prodn. in response to TD-Ags in old B6 mice, although to a lesser extent than did astaxanthin. However, none of the carotenoids had an effect on in vivo or in vitro Ab prodn. in response to T-independent antigen. These results indicate significant immunomodulating actions of carotenoids for humoral immune responses to TD-Ags and suggest that carotenoid supplementation may be beneficial in restoring humoral immune responses in older animals.

ST immunostimulation carotenoid antibody

IT Immunostimulants

(carotenoids as)

IT Senescence

(carotenoids enhancement of immunity in relation to)

IT Antibodies

RL: FORM (Formation, nonpreparative)

(formation of, carotenoids effect on)

IT Carotenes and Carotenoids, biological studies

RL: BIOL (Biological study)

(immunostimulation by)

IT Lymphocyte

(T-cell, helper cell, carotenoids enhancement of immunity in relation to)

IT 127-40-2, **Lutein** 472-61-7, Astaxanthin 7235-40-7,

.beta.-Carotene

RL: BIOL (Biological study)

(immunostimulation by)

L7 ANSWER 13 OF 17

MEDLINE

DUPLICATE 3

ACCESSION NUMBER: 2000407789 MEDLINE

DOCUMENT NUMBER: 20264072 PubMed ID: 10802297

TITLE: Dietary lutein stimulates immune response in the canine.

AUTHOR: Kim H W; Chew B P; Wong T S; Park J S; Weng B B; Byrne K M;

CORPORATE SOURCE: Hayek M G; Reinhart G A
Department of Animal Sciences, Washington State University,

Pullman, WA 99164-3651, USA.

SOURCE: VETERINARY IMMUNOLOGY AND IMMUNOPATHOLOGY, (2000 May 23)
74

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AB The possible immuno-modulatory action of dietary lutein in dogs is not known. Female Beagle dogs (17-18-month old; 11.4+/-0.4kg body weight) were supplemented daily with 0, 5, 10 or 20mg lutein for 12 weeks. Delayed-type hypersensitivity (DTH) response to saline, phytohemagglutinin (PHA) and a polyvalent vaccine was assessed on Weeks 0, 6 and 12. Blood was sampled on Weeks 0, 2, 4, 8 and 12 to assess (1) lymphocyte proliferative response to PHA, concanavalin A (Con A), and pokeweed mitogen (PWM), (2) changes in peripheral blood mononuclear cell (PBMC) populations, (3) interleukin-2 (IL-2) production and (4) IgG and IgM production. After the completion of 12-week study, we continued to collect the blood weekly up to 17 weeks to evaluate the changes in immunoglobulin production upon first and second antigenic challenges on Weeks 13 and 15. Plasma lutein +zeaxanthin was undetectable in unsupplemented dogs but concentrations increased ($P<0.05$) rapidly on Week 2 in lutein-supplemented dogs. Thereafter, concentrations generally continued to increase in dose-dependent manner, albeit at a much slower rate. Dogs fed lutein had heightened DTH response to PHA and vaccine by Week 6. Dietary lutein increased ($P<0.05$) lymphocyte proliferative response to all three mitogens and increased the percentages of cells expressing CD5, CD4, CD8 and major histocompatibility complex class II (MHC II) molecules. The production of IgG increased ($P<0.05$) in lutein-fed dogs after the second antigenic challenge. Lutein did not influence the expression of CD21 lymphocyte marker, plasma IgM or IL-2 production. Therefore, dietary lutein stimulated both cell-mediated and humoral immune responses in the domestic canine.

L6 ANSWER 4 OF 21 BIOBUSINESS COPYRIGHT 1999 BIOSIS
ACCESSION NUMBER: 97:19144 BIOBUSINESS
DOCUMENT NUMBER: 0878010
TITLE: Ailment Specific dietary **supplements**.
AUTHOR: Anon
SOURCE: New Product News, (1997) Vol.32, No.12, Jan. 9, P.40.
ISSN: 1048-020X.
FILE SEGMENT: UNIQUE
LANGUAGE: ENGL

L6 ANSWER 4 OF 21 BIOBUSINESS COPYRIGHT 1999 BIOSIS
TI Ailment Specific dietary **supplements**.
ST NEW PRODUCT ANNOUNCEMENT; FOOD INDUSTRY; NEW PRODUCTS; AILMENT SPECIFIC
DIETARY **SUPPLEMENT**; PRODUCT LINE; VARIETIES; AWAKE AND ALERT;
COLD & FLU WITH ECHINACEA; ENERGY STAMINA BUILDER; EYES WITH LUTEIN;
HEART
AND CHOLESTEROL FORMULA; KAVAROUSE MOOD ENHANCER; KAVA KALM CALMING
FORMULATION; MIND POWER MEMORY ENHANCER; PAIN AND RESTORATIVE; STRESS-
IMMUNE WITH ANTIOXIDANTS; CONSUMER HEALTH; USA
RN 57-88-5 (CHOLESTEROL)
127-40-2Q, 62624-08-

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IT Lymphocyte
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IT 127-40-2, Lutein 472-61-7, Astaxanthin 7235-40-7,
.beta.-Carotene
RL: BIOL (Biological study)
(**immun**